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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,556	03/12/2004	Hiromasa Sato	250241US3CONT	6465
22850	7590	05/09/2007 ¹		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER CHANG, AUDREY Y	
			ART UNIT 2872	PAPER NUMBER
			NOTIFICATION DATE 05/09/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

10/798,556

Applicant(s)

SATO ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-7 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-7 and 12-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/26/2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on February 28, 2007, which has been entered into the file.
- By this amendment, the applicant has amended claims 4, 12 and 14.
- Claims 4-7, and 12-15 remain pending in this application.
- The rejections of claims under 35 USC 112, first paragraph, set forth in the previous Office Action are withdrawn in response to applicant's amendment.

Claim Objections

1. Claim 7 is objected to because of the following informalities:

(1). The amended phrase "saw-tooth shape" recited in claim 7 is confusing since it is not clear if this is referred to the saw-tooth or the pseudo sawtooth diffraction grating as recited in its based claim 6.

What is a saw-tooth shape that is comprised within a pseudo saw-tooth diffraction grating?

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claims 4-6, 12 and 14-15 rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nakanishi et al (PN. 6,728,034) in view of the patent issued to Morton et al (PN. 5,999,318).

Nakanishi et al teaches a *diffractive optical element* that is comprised of a transparent *substrate* (1, Figures 6, 7A, 7B, 10 and 22), wherein a first *diffraction grating pattern* (4), serves as the *incoming-side diffraction grating*, is formed on the *central* region of the incoming-side surface of the *transparent substrate* wherein an external light incidents (L0), and at least one *second diffraction gratings* (5 and 6, or 9 and 10), serves as the *first outgoing-side diffraction and second outgoing-side diffraction grating*, formed on the opposite (or *outgoing-side*) surface, (with respect to the first diffraction grating pattern), of the substrate. Nakanishi et al teaches that the *pitch* of the incoming side diffraction grating pattern is the *same* as the *pitch* of the outgoing-side diffraction grating pattern, (please see column 3, lines 38-40 and column 10, lines 40-52). Nakanishi et al further teaches that each of the first and second diffraction grating patterns comprises a plurality of *slits* and as demonstrated by the drawings 1-17 and 19A, the slit pattern comprises *concave/convex shape*, (please see columns 3-4, 6, 8, and 10). Nakanishi et al teaches that the first and second outgoing-side diffraction gratings (5 and 6) is configured to receive the light **diffracted** from the incoming-side diffraction grating (4), which *means the second outgoing-side diffraction grating positioned on a light path of a light diffracted by the incoming-side diffraction grating*. Nakanishi et al teaches that the outgoing side diffraction grating can be designed to be **reflective** grating, as demonstrated in Figures 6, 7A, and 7B).

With regard to the feature concerning a reflective layer covers the second outgoing-side diffraction grating as recited in claims 4, 12 and 14, Nakanishi et al teaches that the outgoing-side diffraction gratings (5 or 6) can be reflective diffraction grating but it does not teach explicit to include a reflective layer for covering the diffraction grating. But it is standard practice in the art to make a reflective grating by using a reflective layer covering a transmission diffraction grating, as explicitly

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taught by Morton et al, (please see Figures 4 and 9). It would then have been obvious to make the reflective diffraction grating by using a reflective layer to cover the transmission diffraction grating for the benefit of actually making the reflective diffraction grating.

Claims 4, and 12 have been amended to include the feature that the grating pitch of the first outgoing diffraction grating is no longer equal to the grating pitch of the incoming side diffraction grating. But the grating pitch of the second outgoing diffraction grating is substantially equal to the grating pitch of the incoming side diffraction grating. Nakanishi et al teaches that the *pitch* of the incoming side diffraction grating pattern is the *same* as the *pitch* of the outgoing-side diffraction grating pattern, (please see column 3, lines 38-40 and column 10, lines 40-52). This means the outgoing diffraction grating has grating pitch substantially equal to the grating pitch of the incoming side diffraction grating.

With regard to the amended feature of “the incoming-side diffraction grating is configured relative to the light source such that only a center portion of the external light having a stronger intensity than a peripheral portion of the external light passes through the incoming side diffraction grating”. This is a condition relates to **how to employ the** diffraction optical element. One skilled in the art would certainly be able to provide a light source such that only central portion of the incident light beam, having a stronger intensity, to pass through the incoming side diffraction grating. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

With regard to claim 5, Nakanishi et al teaches that the outgoing side diffraction gratings (5 and 6, Figures 6-7B) may also be *reflection* type diffraction gratings.

With regard to claim 6, Nakanishi et al teaches that the outgoing side diffraction gratings (9 and 10, Figure 10) have a saw-tooth like diffraction grating profile.

With regard to claim 12, **Nakanishi et al** teaches that the diffractive optical element can be used in an optical pickup device, which could be considered as a wavelength measurement apparatus.

With regard to claim 15, **Nakanishi et al** does not teach *explicitly* that the first outgoing-side diffraction grating is placed at the center of the substrate. However one skilled in the art would understand that the position of the outgoing-side diffraction grating *determines* the light path that the light received from the incoming-side diffraction grating would travel after being diffracted by the outgoing-side diffraction grating. Such modification therefore is considered to be obvious matters of design choice to one skilled in the art for the benefit of making the light diffracted by the outgoing-side diffraction grating follows a specific path that suits for the specific needs.

4. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Nakanishi et al and Morton et al as applied to claims 1 and 12 above, and further in view of the patent issued to Chen et al (PN. 5,914,811).

The diffractive optical element taught by **Nakanishi et al** in combination with the teachings of **Morton et al** as described for claims 1 and 12 above have met all the limitations of the claims. The **Nakanishi et al** reference teaches that the outgoing side diffraction gratings may have *saw-tooth like shape* (9 and 10 in Figure 10), however it does not teach explicitly that the diffraction gratings are of *pseudo* saw-tooth like shape that is approximated by multiple stepped stairs. It also does not teach explicitly that the incoming diffraction grating is of saw-tooth shape. However using multiple stepped stairs structure to *approximate* the desired diffraction grating profile is rather well known in the art for it provides good accuracy for approximating the desired profile. **Chen et al** in the same filed of endeavor teaches explicitly that a *blazed* grating (i.e. saw-tooth like grating) can be approximated by blazed grooves with M-step stairs, (please see Figures 1 and 2). **Chen et al** teaches that the step heights are selected to best approximate the diffraction profile. It would then have been obvious to one skilled in the

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art to apply the teachings of Chen et al to use M-step stairs structure to approximate the saw-tooth like gratings and to make the incoming-side grating with such structure for the benefit of providing more accurate grating profiles for the diffraction gratings.

Response to Arguments

5. Applicant's arguments filed on February 28, 2007 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and rejected for the reasons stated above.

6. In response to applicant's arguments which state that the cited Nakanishi reference teaches that the incoming light is focused on the diffraction optical element pattern, 4, since Nakanishi teaches a "polarized beam splitting" which requires the entire incident light being polarized. Accordingly, Nakanishi fails to teach or suggest that the incoming-side diffraction grating is configured relative to the light source such that only a center portion of the external light is passed through the first incoming side diffraction grating, therefore differs from the instant application, the examiner respectfully disagrees for the reasons stated below.

Firstly, the cited Nakanishi reference never teaches that the incoming light is **focused** to the diffraction optical element pattern 4.

Secondly, the cited Nakanishi reference although teaches polarized diffraction grating, it **does not prevent** to have a light source such that only the central portion of the incoming light passes through the incoming-side diffraction grating. In fact Nakanishi reference teaches that the diffractive optical element is a *polarization beam splitter* such that the **zero order** diffraction light (L1) or the **non-diffracted** light (with regard to the incoming side diffractive optical element pattern 4) will have a polarization state that is *different* and therefore *separated* from the **diffracted light** outputting from the **outgoing** diffractive optical element patterns, (please see column 8, lines 17-24). The *diffracted* light outputting from the

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outgoing diffractive optical element pattern is from **diffracted light (first or higher orders diffracted light)** produced by the incoming side diffractive optical element pattern 4. This means the **non-diffracted light** or the **zero order diffracted light** will also be polarized. By having a light source that generates incident light beam having only the central portion of the light beam, having the stronger intensity, passing the incoming side diffractive optical element pattern 4, will produce zero order or non-diffracted light having first polarization and diffracted light that further diffracted by the outgoing side diffractive optical element patterns to have second polarization state, wherein the two polarized light are separated by the beam splitter arrangement. The portion of the light that does not pass through the incoming side diffractive optical element pattern 4, will remain non-diffracted and following the same beam path as the zero order or non-diffracted light therefore will be separated or split from the polarized diffracted light from the outgoing diffractive optical element pattern. This diffractive optical element serving as the **polarization beam splitter** will therefore function the same either to have light source generates light beam with only the *central* portion passes through the incoming side diffractive optical element pattern or all the light beam passes through the incoming side diffractive optical element pattern.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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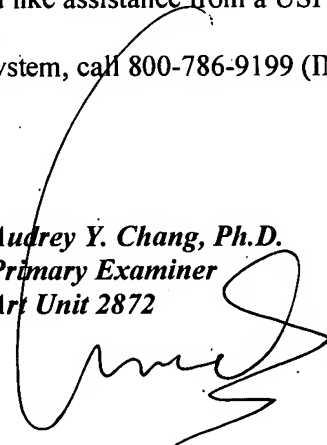
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.